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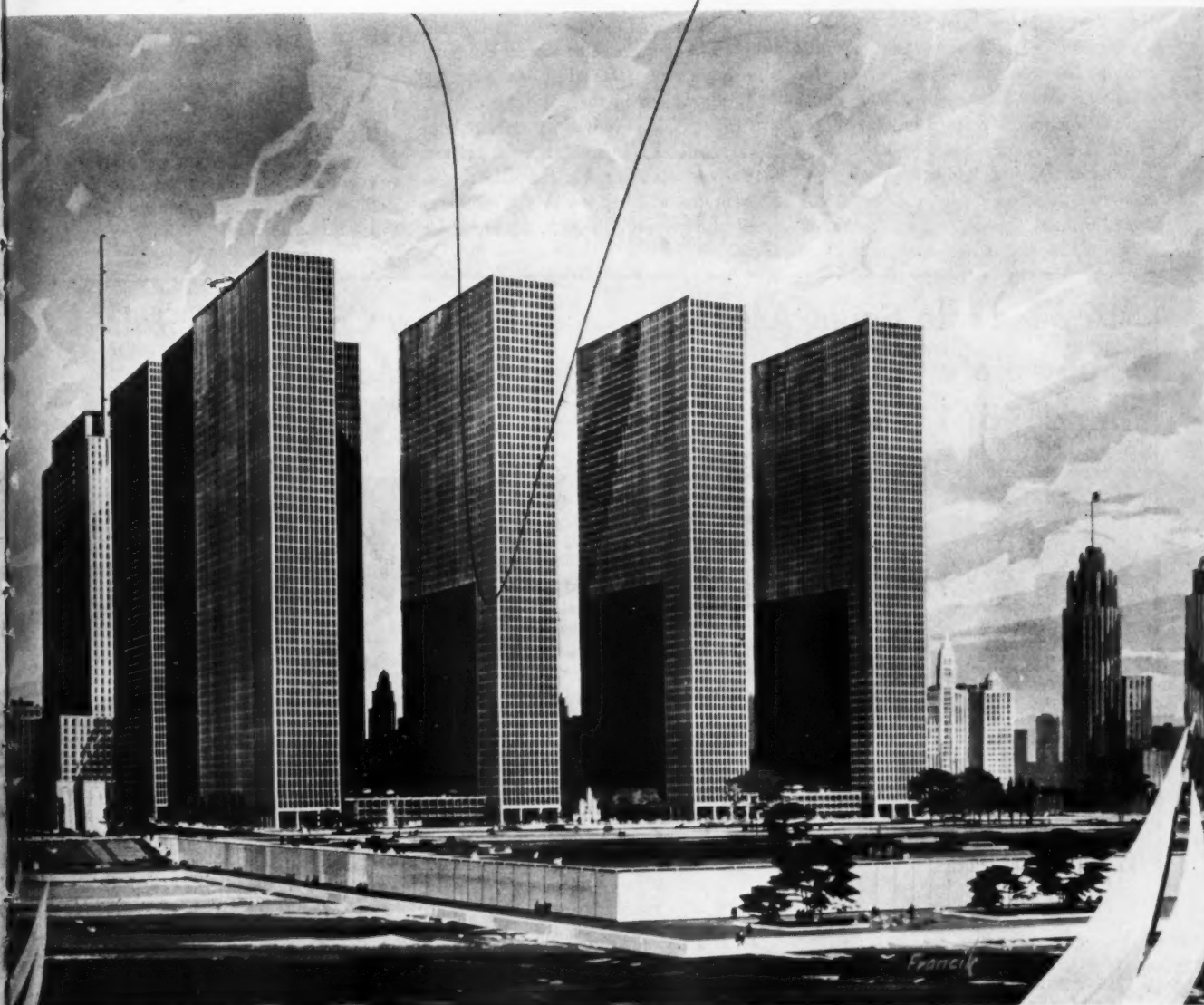
WESTERN  
SOCIETY  
OF ENGINEERS

92<sup>ND</sup>  
YEAR

# Midwest Engineer

OCTOBER 1961

VOL. 14 NO. 2



Above: Artist's rendition of four apartments of Illinois Center

Article on the two multi-million dollar projects soon to be built on I. C. RR air rights site appears on pages 6 & 7.

# Announce Engineering Manpower Inventory

Employer's Inventory of Critical Manpower, a new program endorsed and supported by the Director of Selective Service, which will safeguard the effective utilization of engineering and scientific manpower in the event of a national emergency, was announced jointly by Dr. Sydney B. Ingram, Chairman, Engineering Manpower Commission, and Colonel Daniel D. Omer, Deputy Director of Selective Service at New York, late last month.

According to Dr. Ingram, "present safeguards are inadequate to prevent the wholesale withdrawal of engineering and scientific manpower from industry in a national emergency.

"The increasing importance of technological manpower in the event of armed conflict," he continued, "demands

maximum utilization of engineering and scientific personnel whether in industry or in the armed services. We view with deepest concern present inadequate provision to prevent wholesale disruption of essential production and the slowing down of the rate of technological advance in the event of a sudden and substantial mobilization. The Employer's Inventory of Critical Manpower, developed by the Engineering Manpower Commission of Engineers Joint Council and the Scientific Manpower Commission is an attempt to aid in the solution of this problem in the national interest.

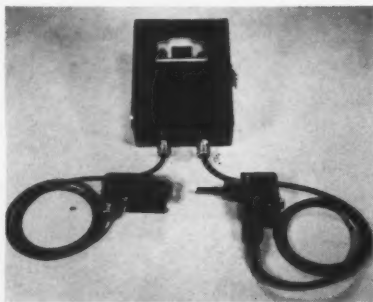
Briefly, the Inventory program supplies condensed information on critical employees liability to the draft and shows what will happen to a given company during mobilization. It identifies

the balance between critical and non-critical personnel, subject to military service, and indicates a probable order of call to armed services during emergency.

It provides employers and Selective Service with a complete analysis of critical personnel problems through the collection and tabulation of relevant Selective Service data. The Engineering and Scientific Manpower Commissions will supply appropriate forms plus current information relative to the draft.

The Manpower Commissions, with the endorsement and strong support of the Director of Selective Service, Lt. General Lewis B. Hershey, urge each member of industry to take advantage of this cooperative program to strengthen national security and, meanwhile, our industrial economy.

## Dependable Count Assured Solid State Counter Model 561



### MODEL 561 FEATURES

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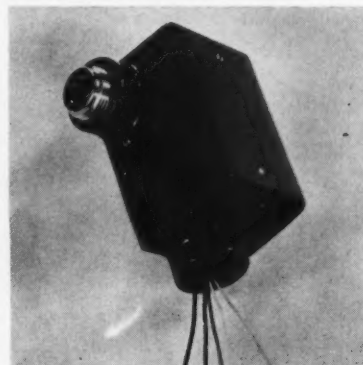
### PHOTO RECEIVER

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## THIS MONTH'S FEATURES

### Major Projects Rise Over

I. C. RR Air Rights Site ....Pages 6 and 7

### "Propane — The Most

Versatile Fuel" .....Pages 8 and 9

### The Application of

Computers to Automatic

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### Argonne Builds Advanced

Facility for Study of

Radioactive Elements ..Pages 12 and 13

.....

## Midwest Engineer

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MIDWEST ENGINEER

## JAMES E. DINGMAN SPEAKS AT FURNITURE MART GENERAL MEETING, OCTOBER 25th

Intense interest in the subject of "Satellite Communications" necessitated reserving facilities at the Furniture Mart to accommodate the many members and guests who are expected to attend.

The speaker, Mr. James E. Dingman, is the newly-elected executive vice president of the American Telephone and Telegraph Co., New York.

Important decisions on national policy in this new frontier of communications are being debated and may soon be reached.

Mr. Dingman's talk deals with the various types of satellite communications

and what we may expect in early and long-term developments.

Mr. Dingman graduated from the University of Maryland in 1921 with a Degree in Mechanical Engineering, entering the Bell System in 1922.

During the following years he held posts of ever increasing responsibilities. In 1952 he became Vice President and General Manager of Bell Telephone Laboratories and in 1956 Director of Operations, Long Lines. In 1959 he was named Vice President and Chief Engineer, American Telephone & Telegraph Co. In August 1961 he became executive vice president.

## Nuclear Notables Meet In Chicago, Nov. 6-10th

One of the largest world-wide gatherings of nuclear notables and scientists will meet in Chicago during the week of November 6-10, 1961.

Such famous people as Congressman Melvin Price; Fermi Award Winners, Glenn T. Seaborg and Hans Bethe; Air Force Secretary, E. M. Zuckert; 1955 Geneva Conference President, H. J. Bhabha from India and others will address thousands of leading national and international scientists and engineers at this time.

The reason: Four different groups will meet at the same time; The American Nuclear Society, The Atomic Industrial Forum, AtomFair and National Youth Conference on the Atom.

These organizations will work with each other throughout this important week. The preliminary program of The American Nuclear Society is enclosed to give a preview of its activities.

Further information can be obtained

from the ANS General Meeting Chairman, John L. Kuranz, Vice President of Nuclear-Chicago Corporation, 333 East Howard Avenue, Des Plaines, Illinois.

## Mrs. Gilbreth to Speak In Chicago Next Month

The Industrial Management Society is holding an Industrial Engineering and Management Clinic Nov. 1-3 at the Pick-Congress Hotel, with Lillian M. Gilbreth, 84-year-old management consultant, as guest speaker at the annual banquet. Mrs. Gilbreth was winner of the Washington Award for 1954.

## Apartment Boom

Figures just released by George L. Ramsey, building commissioner, disclosed that this year thru last month permits were issued for \$103,775,039 in such construction, compared to \$53,764,700 in the corresponding period of 1960.

This is a rise of 93 per cent.

The largest increase, which Ramsey called "phenomenal," was recorded last month, with permits taken out for \$16,931,500 in apartment building, compared to \$1,494,500 in September, 1960.

## Calendar of Chicago Engineering

—OCT. 18, WED., Noon Luncheon Meeting, 12:00 Noon. At WSE Hq.

—OCT. 25, WED., No Luncheon Meeting. Reserved for ASME.

—OCT. 25, WED., General Meeting and Dinner. Reception 5:30 p.m. Dinner, 7:00 p.m. FURNITURE MART, Erie & McClurg Court.

—NOV. 1, WED., Noon Luncheon Meet-

ing, 12:00 Noon. At WSE Hq.

—NOV. 8, WED., Noon Luncheon Meeting, 12:00 Noon. At WSE Hq.

—NOV. 15, WED., Noon Luncheon Meeting, 12:00 Noon. At WSE Hq.

—NOV. 22, WED., No WSE Noon Luncheon Meeting. Reserved for WSE.

—NOV. 29, WED., Noon Luncheon Meeting, 12:00 Noon. At WSE Hq.

# Noon Luncheons and General Meetings Both Off to Auspicious Starts

Opening of WSE's fall activities saw both Luncheon and General Meeting programs off to a fine start with outstanding speakers. These affairs were enjoyed by a splendid attendance by members and a large number of guests.

The speaker on September 6th was Mr. Lee Brand, first vice president, Empire Stove Co. His talk on "Propane, the Most Versatile Fuel", is published in this issue of MIDWEST ENGINEER.

The September 13th speaker was Mr. Julian Tobey, Managing Director of Midwest Coal Producers Institute. His



Julian Tobey and Chairman Johnson

talk, "Coal's Place in the Future Energy Market" presented interesting data and forecasts on present and anticipated developments.



R. M. Goetchius addressing audience of 300 at Sept. 20th Luncheon

A record attendance for a WSE Noon Luncheon Meeting was achieved on September 20th when Mr. R. M. Goetchius spoke on "Communications and Tracking Systems for Project Mercury." An overflow crowd of some three hundred taxed the facilities at 84 East Randolph but by platooning the vast throng all were able to eat and then listen to a fascinating description of the Round the World System built for the National Aeronautics and Space Administration. The presentation included a color movie.

Mr. Goetchius, of New York City, is

Manager of Project Mercury for Western Electric Co.

"Duties and Functions of the County Board" was the subject of a talk featured on September 27th. Mr. Chaplin's remarks offered an insight into the vast projects with which the board is involved, comments on problems and possible solutions.



Commissioner Charles F. Chaplin who spoke at Sept. 27th Luncheon

An extremely timely and informative talk was given by Mr. George M. Lynch at the Oct. 4th Luncheon Meeting. He described how the General Adjustment Bureau functioned and discussed in some detail the problems of making insurance adjustments in the wake of disasters such as those occurring recently in Texas.

## Oct. 3rd Meeting

**Feature —  
Talk and Film on  
"Photography in  
Science and  
Industry"**



Allie C. Peed, Jr.

WSE began its General Meeting Schedule on October 3rd with a program featuring a talk titled "Photography in Science and Industry," by Mr. Allie C. Peed, Jr., Supervisor of Industrial and Scientific Publications, Sales Service Division, Eastman Kodak Company, Rochester, New York.

Mr. Peed's lecture and motion picture films presented a description of the versatility of photography as a teaching tool, a sales tool, and a production tool in the shop and office. The ways in which photography serves industry in research, in production, in quality control, in advertising, in sales and in the training of personnel were depicted.

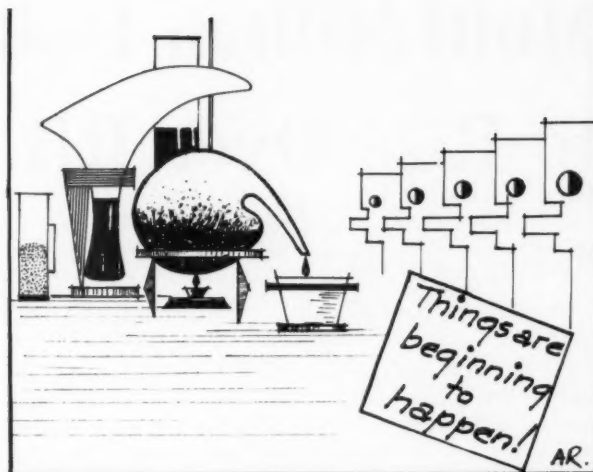
## WSE MEMBERS:

*"Search all your parks in all your cities . . . you will find no statues to committees."*

This good humored verse was written by a man who undoubtedly served on many committees. Of course, the WSE Membership Committee seeks no statues. The Committee is genuinely interested in the growth of the Society and with your help works toward that end.

The 1961-62 year is here. Things are beginning to happen. Many activities will take place. We ask you to bring your engineer guests (non-members) to various Society functions, and we are sure many of them will join our ranks.

## THE MEMBERSHIP COMMITTEE



## ASTM Announces Change In Name

The name of the American Society for Testing Materials was officially changed to the American Society for Testing AND Materials with the signing of a court decree on September 18, 1961, amending the Society's Charter originally granted in 1902 by the Commonwealth of Pennsylvania. The inclusion of the word 'and' in the Society's name places added emphasis on the Society's research work in seeking knowledge of the nature of materials.

It is a further reemphasis of one of the basic purposes for which ASTM was founded in 1898. Since then, the work of the Society has been devoted to the fulfillment of its basic objectives, unchanged from the original Charter which states: 'The corporation is formed for the promotion of knowledge of the materials of engineering, and the standardization of specifications and the methods of testing.' And, to give greater stimulus to the work of the Society in the field of Materials Research, a Division of Materials Sciences was established two years ago.

Although a number of other suggestions for a new name were given serious consideration, there was strong agreement among the membership that there should be a minimum disturbance of the name. In addition there was unanimous agreement that the initials 'ASTM' and the Society's symbol incorporating these

initials, recognized throughout the world as the authority for standards for materials, should be unchanged."

## West Suburban Division Holds First Fall Dinner Meeting

The West Suburban Division of Western Society of Engineers began its third year of dinner meetings on October 11, at Remick's Lilac Lodge, Wolf Road and Cermak Road in Hillside. Following a dinner served at 6:30 P.M. Mr.

Mel Volz, a first pilot with United Airlines, presented a program entitled "The Captivating Caravelle." It was an up-to-the-minute report on United's newest addition to its jet fleet.

Attendance over the past two years has shown a steadily increasing interest in this new Western Society of Engineers group. Activities were resumed this fall under the direction of Mr. Cartwright and Messrs. Arvid B. Newhouse, Wheaton; Lauren R. Asplund, Park Ridge; Charles C. Curtis, Glen Ellyn; Michael Cosgrove, Brookfield; and Paul Bihler, Elmhurst. For reservations call RAndolph 6-1736.

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# Multi-Million Dollar Projects to Rise Over RR Air Rights

## Illinois Central

The Illinois Center real estate development of six square blocks of lakefront property at Randolph St. and Lake Shore Dr., announced earlier this year, has been expanded to a \$500,000,000 project. The expansion was announced sim-

The unique location and view is assured forever since Grant Park (stretching more than 1½ miles to the south between Michigan Ave. and Lake Michigan) must remain free of any buildings.

The apartment buildings will rise 52



Leo J. Sheridan of the Chicago realty firm (right) points to model of apartments (shown on cover). Seated, left to right, are Jack Frost, Illinois Center Chairman of the board and Roland S. Bond, Illinois Center director. Standing in rear left to right are A. C. Allyn, president of Illinois Center and Charles Murphy of Naess & Murphy, architects and engineers.

ultaneously with plans to start construction of two 52-story apartment buildings within the near future.

"A project of this size," said A. C. Allyn Jr. Illinois Center president, "grows in enormity with the completion of final plans on the drawing boards. Our first estimate was that we would spend less than \$200,000,000. We now know that the initial project will call for an expenditure beyond \$250,000,000. When the entire six-block complex has been completed we anticipate a total expenditure in excess of \$500,000,000."

Estimated completion date of the first two buildings is August, 1963. The buildings of 1,250 apartments each, are part of the planned development on Illinois Central air rights west of Lake Shore Drive. Other buildings will be a 2,500 room hotel and a 2,000,000 square-foot office building complex.

stories, be constructed of high-rise steel frame with reinforced concrete walls, and provide 1,040,000 feet of floor space each. Apartment sizes will range from one-room efficiency to three-bedroom types. "A view of Lake Michigan is visible from every apartment in the project.

Naess & Murphy, Chicago architects will design the buildings.

The hotel and office buildings will tower approximately 50 stories high, with the hotel containing about 2,500 rooms and the office complex about 2,000,000 square feet of usable floor space.

The four skyscraper apartment buildings will be built two at a time. The first two at the corner of Randolph and Lake Shore Drive will be completed within the period of two years, and will provide about 1,250 apartments. When

all four are completed, along with the office complex, a total population of approximately 30,000 people will live, work and play in the area.

Garages will accommodate several thousand automobiles on three sub-surface levels, affording parking space at least three times greater than that of a conventional block.

## Lakefront Plaza

One Lakefront Plaza, Chicago, is the first unit in a development that will eventually consist of 8 to 10 apartment and/or hotel buildings located on all of the air rights (over freight yards of the Illinois Central Railroad) lying east of the Outer Drive and extending from Randolph Street to Wacker Drive.

Jerrold Wexler, vice president of George S. Lurie & Co., the sponsoring firm and president of Jupiter Oils, Ltd., is the developer. Hirschfeld, Pawlan & Reinheimer, 327 South La Salle Street, Chicago, are the architects. William Schmidt is the structural engineer.

The Federal Housing Administration recently issued a commitment of \$20 million covering the first building (One Lakefront Plaza) in the gigantic enterprise, a \$26 million 39 story, apartment building to have 940 apartments. The FHA insurance commitment for \$20 million represents the largest ever made and the first made on air rights.

Wexler's principal directive to the architects was that the entire project must constitute a civic asset and that buildings and grounds must create a sense of delight. He specified that the buildings are to be tastefully illuminated at night and that the budget should include sums for sculpture and fountains as well as landscaping.

Except for the commissary, commercial areas will be located on the roof





Pictured is model of One Lakefront Plaza, first unit in 10-building project. This 26 million dollar building will contain 940 apartments

and first and second floors of the building. This arrangement places the lowest apartments 75 feet above the lake and 34 feet above the street. Deliveries to the building will be made at track level. Two floors of garage, covering the entire plot, will be located just beneath the drive level, concealing the

passage of trains below. Most of the top surface of the garage will be devoted to access drives, landscaping and visitor parking.

The building frame will be reinforced concrete. Exterior walls will be enameled brick. Piers of white enameled brick will emphasize the verticality created

by banks of balconies and glass walls at the living rooms. Bedroom windows of grey-tinted glass and black grills of packaged air conditioning units will blend with the mat-black enameled brick in the spandrels between the white piers.

Balconies will be exposed concrete with glass railing panels held in steel frames. A group of exposed structural, concrete columns at the center portion of the south elevation will act as dividers between balconies and become a strong design element, according to Harold S. Pawlan, one of the partners in the architectural firm, entrusted with the design and construction.

The lobby will have marble panels opposite the entrance and will rise through wells in the second floor to a height of 29 feet above the lobby floor. The reception desk and free standing stair to the second floor, will be designed as sculptural forms. The floor will be marble.

The "T" shape of the building will permit grouping all the elevators at the core of the "T", to provide the most efficient service.

## Booklet Contains Data On 36 Bridge Designs

The \$44,000 Steel Highway Bridge Design Competition sponsored by U. S. Steel's American Bridge Division has provided a harvest of design concepts.

J. D. Rollins, American Bridge president, has announced the publication of a booklet illustrating and describing 36 bridge designs selected from the competition's 300 entries. Entitled "36 Ideas for Tomorrow's Short-Span Bridges," the booklet is available to all highway bridge design engineers. Contributions from engineers of many countries are represented in the booklet.

All designs generally place emphasis on ease of fabrication and erection, economy in the use of structural steels for weight reduction, and the integration of different types of steel into a single design.

Publication of the booklet was recommended by the competition judges. They felt that far more entries were worthy of recognition than the 15 winners who shared the \$44,000 in cash awards.

The winners' designs were published

in October, 1959, with the promise that "a more comprehensive booklet would follow at a later date covering many additional excellent ideas deserving mention and review," Rollins said.

"The task was at once challenging, frustrating and satisfying. The entries we did select will certainly contribute to the engineering profession. Of the 300 original entrants, the 36 represented in the booklet were chosen simply on the basis of the individual design ideas they contained.

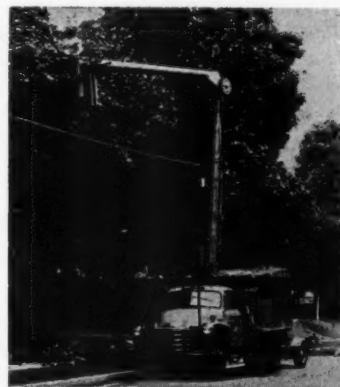
The competition, conducted under the auspices of the American Institute of Steel Construction, Inc., was open to professional design engineers and college engineering students anywhere in the world. Entrants were required to design a steel bridge to carry a two-lane crossroad over a modern four-lane highway.

Copies can be obtained by writing to American Bridge Division, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

## ASPLUNDH Effective and Economical LINE CLEARANCE and Right-of-Way work

Opening of new rights-of-way, and trimming of trees and chemical brush control on existing rights-of-way are operations which should be entrusted only to specialists.

412 N. Milwaukee Ave.  
Wheeling, Illinois  
Attention, Mr. Earl Reynolds



# "Propane — The Most Versatile Fuel" \*

*The Noon Luncheon Sessions and General Meetings of Western Society have been offering programs featuring outstanding speakers on a wide variety of subjects of vital interest in technical, administrative, social and many other fields. These have attracted fine attendance and the comments of those present prompt us to, where possible, publish the transcript or a summary of these talks.*

*That presented here was given at the Noon Luncheon of Sept. 6th by Mr. Lee Brand, First Vice President, Empire Stove Co., Belleville, Ill.*

This is the story of an industry with as much and perhaps more romance than any other industry recorded in history—the LP (Liquified Petroleum) Gas industry. It is a new industry. One which will in 1962 celebrate only 50 years of existence. Yet tremendous things have happened within the industry during those 50 years.

## Two Young Men

During the turn of the century, two young men attending different colleges and not acquainted heard from their professors about the discovery by Herman Blau, a young German in Augsburg, Germany, that certain gases produced from oil could be squeezed together until they became almost entirely liquid and could be kept in that state in heavy steel bottles.

One of these young men was Arthur N. Kerr, a student in the Mechanical Engineering class at Pennsylvania State College. The other was Walter O. Snelling, who was working toward his Bachelor of Science Degree at Harvard University. In 1907, Arthur Kerr was graduated as a Mechanical Engineer and Snelling became a doctor of chemistry. It was several years before their paths were to cross, and they were to play the most important part in forming the LP-Gas industry.

Walter Snelling took a position as a chemist in charge of the Explosive Laboratory of the U. S. Geological Survey in the nation's capital.

Arthur Kerr entered the oil production field and in 1909 formed along with his cousin, C. L. Kerr, an attorney, the Riverside Oil Company at Sistersville, West Virginia. In less than one year,

this fledgling company built nine gasoline plants in the area of Sistersville which is just southwest of Pittsburgh, which had become the center of the new oil industry. In 1910, they built twelve more plants including the first really successful plant at McDonald, Pennsylvania.

The gasoline obtained from these plants was a dangerous product to deal with, largely because of the petroleum gases that vaporized or boiled out of the liquid. At the Riverside Oil Company plant, at Sistersville, where he worked, Arthur Kerr daily was reminded of the hazardous fumes floating over the nearby Baltimore and Ohio Railroad tracks and developed a means of piping away and burning these fumes in controlled flares.

Then, when Kerr saw these flares burning, he was struck by the waste of natural resources, and decided to find a remedy for this waste.

## Condensing the Gas

Working with a young company engineer, Herman Stukeman, Arthur Kerr began experimenting with methods to condense this escaping gas. Success was achieved on December 2, 1910, when liquefied petroleum gas was obtained in the testing set and given the name Gasol. Two hundred gallons of the condensate were processed that year.

During this time, Dr. Walter Snelling and Frank Peterson were also working on LP-Gas development in other ways. During Dr. Snelling's experimentation, he determined scientifically what Arthur Kerr had reasoned his gas to be—a mixture of butane, propane, pentane, and other fractions. Also during his work, Dr. Snelling became acquainted with

Arthur Kerr because much of his work was being done in the vicinity of the Riverside Oil Company at Sistersville.

In 1911, Arthur Kerr, Chester Kerr, Frank Peterson, O. D. Robinson, and Dr. Snelling collaborated in forming the first LP-Gas company, American Gasol Company, which was incorporated under the laws of the state of West Virginia on November 11, 1911.

## First Home System

On May 8, 1912, the first LP-Gas distribution system was completed and shipped to A. F. Young Hardware and Plumbing Company of Union City, Pennsylvania. On May 17, 1912, this system was installed in the farm home of John Gahrng for gas lighting and cooking the meals in the Gahrng home. The second customer was the home of E. E. Wheeler, just up the road from the Gahrng home, and on the back porch of this home is the first steel cabinet used to shelter LP-Gas tanks. The original ceiling fixtures which supplied gas to the Wheeler home are still in place. The same family owns this home.

We are indebted to the National LP-Gas Council and to the National Liquefied Petroleum Gas Association for assembling these historical facts for us, and these are more or less excerpts from the official history of the industry which will be published during the 50th anniversary year of 1962.

Let us see what has happened since that historical day of May 17, 1912, when the first American home started to use LP-Gas. The Department of Commerce, Bureau of Mines, did not pay too much attention to this infant industry until about 1921, so they did not keep any industry records prior to 1921. As a result, we cannot with any authenticity go back beyond 1922 for statistics.

In 1922, the Bureau of Mines records show that 223 thousands gallons of LP-Gas were used.

By 1930, this figure had risen to 18,017,000 gallons.

By 1940, the figure had risen to 313,456,000 gallons.

By 1950, to 3,482,567,000 gallons and by 1960 to 11 billion gallons.

In a period of only 38 years, 13 million American homes had installed this service. This represents better than one third of all the users of gas in the United States. During these 38 years, the use of LP-Gas has increased by more than 50 thousand percent. Is there little wonder why I said at the beginning of this discussion that there was more romance in this industry than any other industry recorded in history.

Thirteen million Americans cannot be wrong. LP-Gas must be filling a need.

### Distribution

As the industry grew, transportation, storage, and distribution became a major problem. Engineers played an important part in solving these problems.

Today there are approximately 25 thousand railroad tank cars and approximately 71 thousand trucks hauling LP-Gas. There are six pipe lines to various parts of the country now transporting LP-Gas and five additional pipe lines are either in the process of being laid or have been proposed to be laid.

### Storage Facilities

There are underground storage facilities for 2½ billion gallons. There is an estimated above ground storage on producers', marketers', and customers' premises for another 3 billion gallons. More storage is being provided daily, and, as a matter of fact, it is almost impossible to keep up with the added storage records. There are approximately 22 thousand marketers of LP-Gas who sell gas to their customers by placing a bulk tank on customer's premises and charging the customer either by the gallon or by metering the gas as done by city gas utilities. In some instances, two or more one hundred pound cylinders of gas are placed on the customer's premises and the customer is charged by the pound, by the cylinder, or through a meter. In other instances, LP-Gas is served by piping gas from a centrally located storage system into the customer's home and charging by metering the gas just as the city utility.

Now what has caused this tremendous growth of this infant industry from such a humble birth?

First and foremost, the industry is healthy because it has a strong, well knitted together National LP-Gas Association with over three thousand members which watches for and takes steps to solve any industry problems. Secondly, it is because the promotional arm of the industry, The National LP-Gas Council, with over 12 hundred members has and is continuing to do an outstanding job of promoting and selling new customers and new product uses.

It is also obvious that LP-Gas has filled a need of suburbia and rural America by providing them with the same

clean, comfortable, automatic, and dependable gas service.

The farmers cultivate economically with LP-Gas and even run their trucks, and tractors with LP-Gas.

Finally, the LP-Gas industry is a vital factor in the country's employment picture—providing income for two and one half million families.

*\*The historical facts in this article are provided by the National LP-Gas Council and the National Liquefied Petroleum Gas Association. The official history of the industry will be published during the 50th anniversary year of 1962.*

## ASTM Presents Report On Corrosion Of Non-Ferrous Metals and Alloys

A report on galvanic and electrolytic corrosion of plate-type galvanic couples was presented at the meeting of Committee B-3 on Corrosion on Non-Ferrous Metals and Alloys during the recent 64th Annual Meeting of the American Society for Testing Materials, in Atlantic City, N. J. In this study two magnesium-base alloys were coupled to seven aluminum alloys, mild steel, type 304 stainless steel, (plain and chromium plated), red brass, and monel. The first year of exposure showed that the seven aluminum alloys had the least galvanic corrosion when coupled to either of the magnesium-base alloys, although all of the aluminum alloys were approximately equivalent in their galvanic effect on these magnesium alloys. There was no significant difference between galvanic corrosion caused by high-purity and commercial-purity aluminum alloys. The magnesium alloys suffered the severest galvanic corrosion when in contact with

brass, monel, mild steel, and stainless steel.

The apparatus designed to measure time-of-wetness and temperature of the specimens and the SO<sub>2</sub> content of the atmosphere have been in operation for almost six months. The copper, zinc, and steel panels exposed with this apparatus have been withdrawn from exposure over this period and data are presently being developed to determine how well the apparatus functions in a variety of environments.

The one-year exposure specimens of 77 non-ferrous metals and alloys exposed at four test sites are being assembled. The two-year specimens have recently been withdrawn for testing.

The Cass and Corrodokote Corrosion test methods developed by the American Electroplaters' Society for electroplated coatings have been approved by the committee for publication by the Society.

The article — "Propane — the Most Versatile Fuel" and the ASTM report on galvanic and electrolytic corrosion of non-ferrous metals and alloys, are published to implement the intent of The Jackling Bequest. The two articles serve to illustrate the broad fields of interest that are covered under the provisions of the bequest.



# The Application of Computers to Automatic Boiler Operation

The addition of a computer to automatic boiler and power plant controls, commonly called "automation," merely substitutes a properly sequenced program for the functions previously performed by operators. By monitoring temperatures, pressures, flows, fluid levels, damper and valve positions and the operation of auxiliaries, and by correlating the information, it determines the action required for proper control.

A computer cannot think but it can remember. It can do only one thing at a time but does it at incredible speed. It can read, solve mathematical problems and even use logic, but it cannot do this any better nor to any greater extent than it has been taught. Its limits are those given to it by the people who program it.

If the computer is provided with the correct monitoring and sensing devices, and if it is programmed to take in every conceivable eventuality that can occur during boiler operation, it can prevent furnace explosions and other casualties by correcting conditions or by tripping out pieces of equipment, or the entire unit, before damage can occur. Other benefits include:

1. **A reduction in the number of outages.** By taking prompt and corrective actions during emergency conditions, the chain reactions, so often encountered, can be stopped.

2. **Less maintenance.** Better control of temperatures and pressures and of the rates of temperature change will minimize overstressing and overheating and reduce the possibility of pressure part failure.

3. **Increased average unit efficiency.** Improved efficiency, and fuel saving, can be obtained by more precise monitoring of the boiler operating conditions and the heat rate data on which to base unit loading.

4. **Fewer operating personnel.** This is a future benefit, since initial applications probably will require more and higher caliber man power.

Against these benefits must be weighed

the disadvantages. A computer is complex, it requires careful maintenance, its reliability has not been fully tested, and it is expensive. The additional sensing devices and operating equipment required for computer application also are expensive considerations.

**PROGRAMMING** consists in planning step by step the computer's actions required to do the job. Each step is carefully detailed and the details are then translated to diagrams known as flow charts. By assigning numbers and by cataloging every switch position, temperature, contact closure, or other condition that will be scanned or stored in the computer's memory, the proper reference number can be listed on the flow charts.

It is mandatory in flow charting to provide sequences that can be stopped without harm to the equipment, or to program operations so that they cannot be stopped until it is safe to do so. The interrelation of boiler, turbine and auxiliaries must always be taken into account.

**METHODS OF AUTOMATION—**By establishing control of functional groups such as the combustion control system, the superheat and reheat temperature system, water level and flow, fuel preparation and transport, burners, safety interlocks, and superheater and turbine bypass and flash tank system, the computer can release these sub-loops or take on their operation as required.

During operation, the computer first scans conditions and references, then acts; or, if it cannot carry out the required program, sounds an alarm.

Much engineering know-how is required to determine the type and location of sensing devices to activate the proper controls and, even more important, is the proper sequencing of the operations.

**FLAME DETECTION AND BURNER CONTROL** have been the stumbling blocks to full automation. While recent flame detecting equipment developments have resulted in consider-

able improvements, more research in this area is required. Pressure switches, electric contactors, solenoid valves, gas analyzers, flow indicators and samplers must be made more accurate, sensitive and reliable.

When this is accomplished, conventional controls could disappear and their functions be taken over by a computer acting directly on the control drives. The computer, with its complete knowledge of all boiler operating conditions plus its ability to correct upsets or to shut down the unit safely, would virtually eliminate the danger of boiler explosions.

*(Summarized from "Automation—The Application of Computers to Automatic Boiler Operation" by G. W. Kessler, Chief Engineer, Boiler Division—The Babcock & Wilcox Co.)*

## PIPE COILS DATA

A four-page illustrated brochure on tubular products describes a wide choice of coils, bends and fabricated piping available for numerous industrial processes and heating applications. Pipe coils offer a most efficient means of heating and cooling liquids, solutions, vapors and gases. The wide variety of coil shapes and styles makes the use of such pipe coils a practical and economical method of heat transfer. The coils can be fabricated from any ferrous or non-ferrous metal, in any shape or design, and engineered to any specific heat absorption or radiation requirements.

This brochure, No. PC-61, is available on request from the Rempe Co., 340 North Sacramento Blvd., Chicago 12, Ill.

## AUTOMATED RADIO STATIONS

By mid-1963, about a fifth of the nation's 5,477 radio stations may have automated their broadcasting operations, Electronics, McGraw-Hill publication, reports. For about \$6,000, stations can buy equipment that permits them to tape and then air 18 hours of music, disc jockey chatter and other programs without touching a phonograph record.



## 19 Engineering Groups Now Housed in New \$12,000,000 Building

Some nineteen engineering organizations moved September 1, and over the holiday week-end to the new 20-story, \$12,000,000 United Engineering Center on United Nations Plaza, between 47th and 48th Streets; the Center is owned and operated by United Engineering Trustees, Inc.

The Center now becomes the largest concentration of professional engineering societies in the Free World.

The nineteen organizations are the initial occupants, with room available for others in the future. The occupants include the five "Founder Societies"—The American Society of Civil Engineers, the American Institute of Mining, Metallurgical, and Petroleum Engineers, The American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Chemical Engineers.

Others are: United Engineering Trustees, Inc., American Institute of Consulting Engineers, American Institute of Industrial Engineers, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, American Welding Society, Engineering Foundation, Engineering Index, Engineering Societies Library, Engineers Council for Professional Development, Engineers Joint Council, Illuminating Engineering Society, Society of Women Engineers, The Municipal Engineers of the City of New York, and Welding Research Council.

Formal dedication has been scheduled for early November, with former President Herbert Hoover as Honorary Chairman. Ground-breaking, at which Mr. Hoover officiated, took place on October 1, 1959, and the cornerstone laying ceremony, at which Mr. Hoover again officiated, was held June 16, 1960.

## Obituaries

ARTHUR J. BOYNTON, president of A. J. Boynton & Co., a firm which he founded some twenty years ago, died on August 17th. Mr. Boynton was born in Elyria, Ohio. He attended Ohio University and upon completion of four years of study joined the organization that was later to become the National Tube Co. in 1896. Starting as laboratory chemist he remained with that company until 1920 at which time he had for some years served as General Superintendent of Blast Furnaces and Coke Ovens. The next twenty years were devoted to activity with Woodward Iron Co., Woodward, Ala. as vice-president and general manager and with H. A. Brassert & Co. as vice president.

Mr. Boynton was for many years active in AIME, ASME and the Western Society of Engineers.

GEORGE S. GRALEWSKI, senior design checker (military electronics) with Admiral Corp., died August 30th. Mr. Gralewski, whose residence was in Skokie, joined WSE last March. Mr. Gralewski, who was 50, was a graduate

of Pratt Institute of Science and Technology, Brooklyn, N. Y. He came here in 1955 and had been associated with Admiral since 1959.

JACK B. KOLKO, president and owner of the Speedway Wrecking since 1920, died August 28th. He had been an active member of WSE since 1955.

HERMAN GANNSEN, a member of WSE since 1907, died August 24th. For a number of years up until 1958 he had been consulting engineer for the Yaryan Heating Project in Oak Park. He was born in Germany in 1877. He graduated with honors from the Engineering College at Stuttgart and after several years of engineering work in Germany and England came to this country in 1905 and soon thereafter joined the American Can Co. Later he was associated with Cook & Chick Co., serving that organization as president for several years. He attained Life Membership with WSE in May 1938.

STEPHEN W. HARRINGTON, Sales Manager-Staff with Illinois Bell Telephone Co. until his retirement in 1959, died September 16th. Mr. Harrington, who was a native of Chicago, joined Illinois Bell in 1917 and during the next forty-one years served successively in such capacities as special studies engineer, staff sales supervisor and division service manager. Mr. Harrington attained Life Membership in WSE in May 1959.

## CAN ENGINEER PLANS CONSTITUTE INTERSTATE COMMERCE?

Can engineering plans prepared in one state for use in another be considered interstate commerce? In the opinion of Consulting Engineers Association of California attorney Arthur Mendelson, they very likely can. Commenting on the matter in CEAC's *Monthly Report*, Mendelson advised that engineering plans prepared (for example) in San Francisco, for use on a building project in Phoenix, would, upon shipment to that city, probably qualify as interstate commerce.

The ultimate utilization of the drawings appears to be the determinant, said Mendelson.

(From Consulting Engineers Council Newsletter July-August, 1961—Consulting Engineers Council, Springfield, Ill.)

## CANADIAN CONSULTANTS PUBLISH MANUAL OF PRACTICE

The Association of Consulting Engineers of Canada announced publication this month of a Manual of Practice for engineers in private practice in Canada. Prepared for use as a guide to the consulting en-

gineering profession, and to all those concerned with the services of the consulting profession, the new ACEC document contains 44 pages, is loose-leaf and paper bound.

Titles of the Canadian Manual's major sections are: The Consulting Engineer, Professional Services of a Consulting Engineer, Selection of a Consulting Engineer, Agreement Between Client and Consulting Engineer, Charges for Consulting Professional Engineering Services, Standards of Performance, and Duties and Responsibilities of the Consulting Engineer. A typical paragraph reads:

*"Fee competition is inimical to the interests of both the client and the consulting engineer. The ethical engineer will not engage in this practice or set his fee lower than he knows to be sound. It is unfortunately true that some consulting engineers do try to obtain work by fee cutting but the client should realize that this will rarely, if ever, result in a saving to him. A consulting engineer who violates the ethics of his profession is not likely to show more concern for the interests of his client."*

The organization's headquarters office is at 160 Eglinton Avenue, East, Room 103, Toronto, Ontario.

(As reported in Consulting Engineers Council Newsletter).

## ARGONNE BUILDS ADVANCED FACILITY FOR STUDY OF RADIOACTIVE ELEMENTS

One of the world's most advanced facilities for studying highly radioactive chemical elements that are made by man is under construction at Argonne National Laboratory, Argonne, Illinois.

It is a \$4 million dollar project.

The facility is a three-story wing of cave-like shielded cells and of laboratories now being added to the Argonne chemistry building. The wing will serve as a center for fundamental research with man-made elements that are heavier than uranium.

The addition is being built at Argonne's site 25 miles southwest of Chicago. Construction by the Edward Gray Corp., Chicago, began in May and is expected to be complete in the latter part of 1962.

The Catalytic Construction Co., Philadelphia, is architect-engineer for the \$4,400,000 project.

The new laboratory structure is being built of reinforced concrete with iron ore mixed into the concrete in areas where highly radioactive materials will be handled.

The wing will be approximately 95 feet wide and 320

feet long. The total floor area will be almost 64,000 square feet.

Shielded cells at the west end of the wing will contain elaborate equipment for performing chemical experiments by remote control. They will be equipped with radio-controlled carts or "mules" for carrying radioactive specimens and experimental apparatus. Scientists will use master-slave manipulators (mechanical hands) to perform experiments in the cells.

Commenting on the new facility, Dr. Norman Hilberry, Argonne Laboratory Director, stated:

"This will be the most complete laboratory of its type. It will be used for isolating and conducting experiments with man-made elements.

"We have only a few millionths of an ounce of some of these elements, but we are now trying to obtain enough of them so that we can study their chemical and nuclear properties."

The shielded cells, most unique feature of the new wing, will contain elaborate safeguards against the spread of radioactivity.

The "hot cells" for handling radioactive materials will be on two floor levels. On the lower level there will be four cells each shielded against one million curies of gamma radiation as well as one trillion fission neutrons per second. Each of the four cells will be 16 feet wide, 14 feet deep, and 12 feet 3 inches high. Walls of the cells will be four feet thick. They will be of concrete containing magnetite iron ore, for extra shielding, to a height of eight feet, and of ordinary concrete above that level.

On the upper floor there will be cells for handling sources of less intense radiation. Two large cells and one smaller cell will be shielded against one thousand curies of gamma radiation and one billion fission neutrons per second. Five small analytical cells on this floor originally were rated at ten curies of gamma activity but actually should handle several times this amount. Walls on this floor will be 28 inches thick and, with the exception of the analytical cells, will be of magnetite concrete up to a height of eight feet.

Scientists working in the new laboratory will view their experiments through windows that are as thick as the walls of the hot cells. These will be composed of zinc bromide solution, a heavy liquid that shields against radiation, between plates of a special glass that will not discolor under radiation bombardment. (This special glass is a development by Argonne and the glass industry.) Forty windows will be built into the complex of cells. In the cells where extremely radioactive materials will be handled, the windows will each have an extra slab of high-density glass to protect against decomposition of the zinc bromide solution.

Many of the experiments in the laboratory will use materials that emit alpha particles. These alpha-emitting materials are highly toxic if inhaled, ingested, or introduced into the body through breaks in the skin. In order to contain

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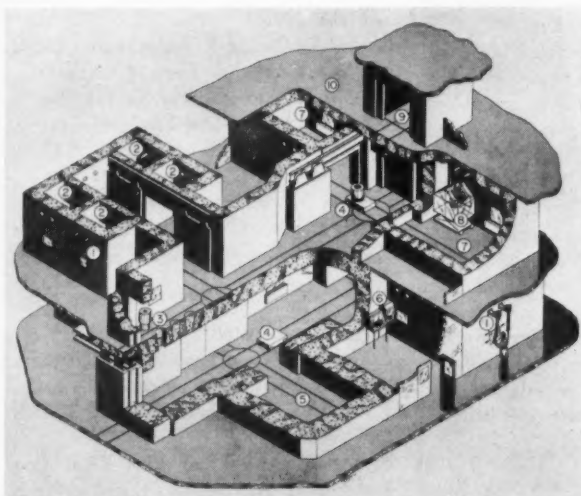


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the alpha emitters, these experiments will be performed in sealed boxes behind the walls of the hot cells. The boxes are designed so that they can be dismantled and disposed of by remote control without allowing the radioactive contamination to be spread beyond the special cell where this work will be done.



CHEMISTRY HOT LABORATORY SCHEMATIC DRAWING

- |  |  |
|--|--|
| 1 ARGONNE-DESIGNED MASTER-SLAVE MANIPULATORS                                     | 6 TRANSFER APPARATUS LEADING TO GLOVE BOX  |
| 2 CELLS FOR ANALYTICAL RESEARCH WITH SOURCES OF LOW-INTENSITY RADIATION          | 7 TYPICAL CELLS FOR HANDLING RADIATION SOURCES OF MEDIUM INTENSITY (WALLS 28 INCHES THICK) |
| 3 FLOOR PLUGS FOR TRANSFER OF SPECIMENS  | 8 SEALED CONTAINMENT BOX FOR HANDLING ALPHA-GAMMA EMITTERS                                 |
| 4 RADIO-CONTROLLED CARTS   | 9 ELEVATOR   |
| 5 TYPICAL CELL FOR HANDLING SOURCES OF INTENSE RADIATION (WALLS 48 INCHES THICK) | 10 STORAGE AREA ON THIRD FLOOR   |

In addition to the cells for handling highly radioactive substances, the new wing of the Argonne chemistry building will have laboratories for research with materials that do not emit large amounts of penetrating gamma or neutron radiation, but do contain large amounts of the alpha emitters. An isotope separator will also be housed in the wing.

In designing the new chemistry building wing, Argonne scientists devised highly-efficient waste disposal and ventilation systems to prevent the spread of radioactive contamination.

Requirements for the wing were established by a committee of Chemistry Division scientists headed by Dr. Donald C. Stewart, Associate Director of the Division. C. Harry Youngquist and William C. Mohr were responsible for the design of the shielded cells. Bernard F. Oswald (2530 West Jarvis Ave., Chicago) of Argonne's Plant Engineering Division is Project Manager.

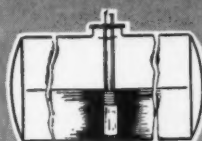
Argonne National Laboratory is operated by the University of Chicago under contract to the U. S. Atomic Energy Commission. The Laboratory is one of the leading centers for research into peaceful applications of atomic energy.

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The unit may be purchased, or may be leased for a basic period of six months with options for monthly rental beyond the contract period.

Further information may be obtained from Dow Industrial Service, Division of The Dow Chemical Co., 20575 Center Ridge Road, Cleveland 16, Ohio.

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## IS IT THE PROPER THING TO DO?

*NOTE: This column deals with standards of conduct in the engineering field. The editor invites comments and criticisms on the ethical problems considered herein. Questions submitted on engineering ethics will be given careful attention. You should address your letter: The Editor, Midwest Engineer, 84 E. Randolph St., Chicago 1, Ill.*

**QUESTION:** Assuming a committee of serious-minded and dedicated members of a society of engineers is appointed to compile a set of rules of good engineering practice. In due time, these rules are adopted by the society and are recommended to the members as a guide. Can the society impose its will on the members of the society to abide by the rules?

**REPLY:** Certainly a society can compel its members to abide by the rules of the society, under pain of expulsion. Considering one particular society, such as the Illinois Society of Professional Engineers, the Constitution of that society provides in Article II, Section 1, "The objectives of this society shall be: . . . (d). Maintenance of high ethical engineering conduct and practices." The Constitution of the Illinois Society of Professional Engineers provides in Article IV, Section 1: "All members shall adhere to the Code of Ethics of the society and the Canons of Ethics for Engineers adopted by the National Society."

Inasmuch as membership in any society is a contractual agreement by all of the members to abide by the consti-

tution and by-laws of the society, there is no doubt that if the "rules" are the canons of ethics set out in the constitution then the members are duty-bound to abide by the "rules."

It should be noted that one must always look to the objectives of the society; in the event that the objectives of a particular engineering society are to, say, promote square dancing by engineers, then that society would not be acting in a proper manner if it attempted to attain high ethical standards in engineering.

Thus, one must look to the society and each society, of course, has different objectives, so the answer may not be universally true; however, it should always be borne in mind that members of a society are entering into a contractual agreement with each other to work toward the objectives of the society and, should any member fail to do so, he then may be expelled from the society because he has failed to meet his obligations to the other members of the society.

\*An opinion of the Panel on Engineering Ethics of the Division on Education and Research of the Western Society of Engineers.

## Issue Directory of Limestone-Dolomite Producers in Ill.

A recently published directory of Illinois limestone and dolomite producers lists some 240 operations and over 180 different companies or individuals operating in 61 counties throughout Illinois. The directory was compiled from the most complete information available at the time of listing and gives, where possible, for each operation the name of the operating company or individual, the mailing address, the name or number of the quarry, the name of the county in which the quarry is located, and the approximate location within the county according to distance and direction from the nearest town.

Stone quarries in Illinois have grown in size and number to supply the demand for stone products throughout the state. In northeastern Illinois, which includes the Chicago district and areas to the south and west, large operations not only supply stone for local markets, but also ship stone to more distant points in Illinois. In the northwestern section of the state, many small producers supply local markets. In the area around and to the south of East St. Louis, a number of quarries supply important amounts of crushed stone for the large and growing markets in that locality. The eastern and southeastern parts of the state have few producers of stone, and most of the operations are relatively small.

This directory has been published because frequent requests for information concerning the location of Illinois

quarry operations are received by the Illinois State Geological Survey.

### DIRECTORY OF ILLINOIS LIMESTONE AND DOLOMITE PRODUCERS

(W. L. Busch). Division of The State of Illinois Geological Survey — Urbana — John C. Frye, Chief.

## Average Pay Up 5% for IIT Engineering A New High

1961 engineering graduates of Illinois Institute of Technology received an all-time high in average beginning salaries, earning approximately 5 per cent more than their counterparts in 1960, according to E. C. Kubicek, IIT director of placement and alumni relations.

The newly graduated engineer started to work for an average salary of \$550 a month, compared with a \$525 average the year before. The beginning metallurgical engineer led the salary field this year, earning an average of \$590, a full \$70 more than in 1960, Kubicek said.

Income averages varied according to specialized fields. Electrical engineers received \$566 per month this year, compared with \$544 last year; chemical engineers \$548 against \$530 last year; industrial engineers \$542 against \$493; mechanical engineers \$537 against \$520; and civil engineers \$531 against \$510.

Kubicek stated that these averages were reached through analysis of 2,300 personal interviews arranged by the Illinois Tech placement office between members of the classes of January and June, 1961, and representatives of 325 companies.

The electrical machine industry was first job choice of the recent graduates, Kubicek said. Graduate work placed second, continuing the upward trend of advanced study by IIT BS degree holders. Many 1961 graduates were attracted to the fields of utilities, aerospace transportation, farm, construction and mining machinery, metalworking and specialties, food and kindred products, and office equipment machinery, he remarked.

## How to Avoid Damaging Utility Facilities When Excavating

The elimination of accidents and service interruptions, caused by digging into underground utilities, is the aim of a new booklet called "Investigate Before You Excavate." It has been published by local utility representatives in cooperation with the Illinois Commerce Commission, 160 North La Salle St., Chicago 1, Ill. It outlines protective and preventive measures and advises consultation and exchange of information with utility companies and municipalities owning facilities involved. According to George R. Perrine, chairman of the Illinois Commerce Commission, the booklet has

been distributed to excavating contrac-

In explaining what should be done during construction the following points are emphasized: 1) Be sure shoring is adequate; 2) Be sure barricades are in place; 3) Be sure excavation is properly lighted.

Prior to construction contractors are advised to contact utilities well in advance of starting the job so they can be advised on location of facilities and to brief workmen on the location and importance of existing structures.

### Management courses—

A Booklet issued by the University of Illinois contains information on a Practical Short Course on Development of Supervisors as Members of Management. For some years this course has been conducted at least three times a year.

The groups taking courses have been made up of about 30% first line supervisors, 30% middle line management such as superintendents, 30% supervisors of staff functions such as engineers, time study, etc. and 10% top plant management. The course is designed to develop in the supervisor a broader understanding of his management job and to present significant information and data about managing procedures.

It is pointed out that holding classes at the campus frees participants from the usual job interruptions.

Current schedule initiating in June of this year continues with classes to be given January 21-February 2; June 11-22, 1962 and at additional intervals thereafter through June 1963. Literature is available from the University of Illinois Extension Division, 116e Illini Hall, Champaign, Ill.

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## Device Mounts on Truck to Wash, Scrape, Paint Highway Guardrails

A unique machine designed to wash guardrails, scrape off old paint, and even repaint guardrails of all types is named the "Guardrail Maintainer."



Preliminary tests indicate a ten mile stretch can be completely refurbished in less than 3 days, and the machine only requires a crew of 3 men.

Consisting of five separate components, the "Maintainer" is designed to perform one operation at a time. For example, if the guardrail is to be washed, the washing attachment hooks up to the boom at the front of the truck and quick connect water lines are engaged. The truck pulls up next to the guardrail and the washer is locked into washing position. The truck then drives along the rail with the washer in operation. To remove old paint, the brushes in the washer are replaced with heavy duty wire brushes. The water is shut off and the machine is ready to go.

Paint is applied by a special carrier assembly similar to the washer.

All three of the operations are performed at the front of the truck operating from a telescoping boom and extension arm assembly that attaches in place of the front bumper. This unit is designed to allow up and down movement of the truck as well as differences in the height of the guardrail in relation to the ground. It also allows for side to side movement of the truck as it is being driven along.

The fifth unit that makes up the complete machine is the 675 gallon water tank and the supporting power-pack.

Since the water tank and power-pack are very large and heavy, the designers recommend a four to five ton truck be used to carry these components.

Complete information may be obtained by writing direct to: Ross and White Co., 400 West Madison St., Chicago 6, Ill.

## Multipoint Gages for Indicating Draft, Pressure

A new bulletin describes the complete line of Rockwell-Republic multi-point gages for indicating draft, pressure, differential and temperature.

The four-page publication describes the gages, discusses product features in detail and illustrates them in cut-away photographs, lists standard scale ranges, provides diagrams and numerical data on mounting dimensions and includes diagrams and text on gage installation.

Copies of bulletin 322-11 are available from Republic Flow Meters Company, 2240 Diversey Parkway, Chicago 47, Ill.

## Night Lighting Switch Adjusts to Changes in Sunset-Sunrise Times

A new line of astronomic dial time switches, designed to permit automatic control of night lighting in relation to the rising and setting of the sun, has



recently been introduced by International Register Company, 2624 W. Washington Blvd., Chicago 12, Ill. Known as the Intermatic V225000 Series, it is recommended for controlling night lighting of store windows, parking lots, factories, street lights, etc.

The astronomic dial series turns lights ON at sunset and OFF at sunrise, or any other pre-selected time. No seasonal resetting is necessary as the time switch automatically adjusts itself throughout the year for daily changes in sunset and sunrise times. A special cutout dial also allows skipping of operation on selected days.

Available in 120 or 240 volt, DPST or SPDT switch, these models are each tungsten-rated at 40 amps per pole and powered by a heavy duty, industrial type timing motor for efficient operation in extremes of heat or cold.

## ELECTRONIC NOSE

Midwestern research workers are trying to build an electronic nose that would detect smells according to changes in the electrical potentials on its surface. Electronics, McGraw-Hill publication states. The nose could be used in studying food aromas, food spoilage, industrial or military warning systems and even for finding out if there are smells in space.

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## New Machining Steel Offered by Inland

Inland Steel has announced the introduction of a new product for the metalworking industry. It is a free-machining steel produced by the addition of tellurium to presently available machining-grade steels. Full potential of the tellurium-bearing steel has not been established, the company said, but many tests already conducted show cutting speeds almost twice those of the best free-machining steels now on the market.

The new steel cuts so readily, the company said, that the laboratory research men working on its development during the last six years sometimes nicknamed it "buttercut."

Extensive tests in automatic screw machine shops of customers for the new free-machining steel substantiate the company's predictions of improved machinability.

Tellurium was described as a relative newcomer to industrial use although the element was discovered in 1798. It is about as rare as gold and obtained principally as a by-product of copper and lead refining.

Industrial application of the substance is expected to spur the development of additional sources and lead to more recovery from refining processes. Inland said that the present limited supply will restrict the production of tellurium-bearing steel even though a few hundredths of one per cent by weight is needed to obtain the benefits it contributes to machinability of steel. The new steel has the equivalent of a built-in lubricant and makes small chips in the cutting process which fall away from the tool and so reduces heat build-up.

## Safety Award to I. C.

Safety programs conducted by the Illinois Central Railroad during 1960 won a National Safety Council Public Safety Activities Award for the railroad. The award is the fourth earned by the Illinois Central. It previously was presented to the railroad for safety programs conducted in 1957, 1958 and 1959. The citation to the Illinois Central recognized the railroad's trespass program carried on in 843 schools reaching 900,000 children; the company's safety

work with civic and fraternal organizations; its highway-railroad crossing accident prevention efforts; distribution of safety films and the production and distribution of safety messages to commuters.

## New Lighting Concept By Westinghouse

Westinghouse lighting engineers have unveiled the first commercial application of a new interior lighting concept that rivals the outdoors in providing visual effectiveness.

The development has major interest for architects and builders of commercial, public, and institutional buildings with special emphasis in structures or areas where acute visual perception is a vital requirement.

The new product may even double what the eye can perceive under present-day interior lighting conditions. Colors appear more true to life. Glares and blind spots caused by the lighting flares of conventional interior lighting are

substantially eliminated. And depth perception is appreciably improved.

The development utilizes a new method of polarization. Its potentials as an aid to improved interior lighting have been long known.

Major change over present-day lighting fixtures is in the diffusion panels which are of special light polarizing materials that create the new illumination with its many visual benefits. Conventional light sources, such as the fluorescent tube, are used.

The new development does not mean the use of stronger lighting. Merely increasing candle power often intensifies such flaws as color bleaching and glares that are found with present-day interior lighting.

Major interest in our new lighting is expected to come from school and hospital planners where acute visual perception and eye comfort are of primary importance. Architects and designers can now plan interiors and have the colors they visualized on their drawing boards appear true to life in the final structure.

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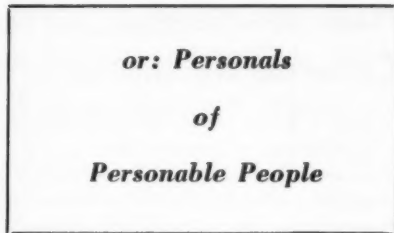
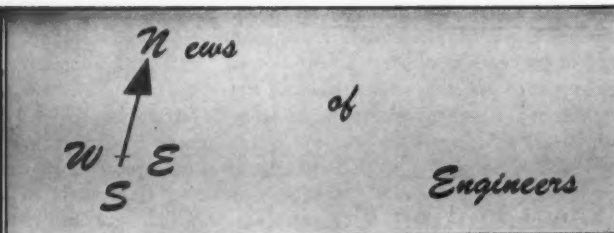
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**Thomas J. Barkley** has been appointed sales manager of The Barkelew Electric Mfg. Co., Middletown, Ohio. He has been with General Electric Co. in Chicago and for the past five years been a sales engineer for the Assemblies and Components Sales Department and more recently the newly organized Agency and Distributor Sales Operation. He also served as liaison between the General Electric Co. and local electrical code authorities. Before joining General Electric, Mr. Barkley was with several Chicago contractors as electrical engineer. In 1954 he was appointed electrical engineer for the City of Chicago. Barkelew's president, C. W. Denny, says that Barkley will direct the reorganization program now underway.

**Harry G. Todman**, has retired after 42 years with United States Gypsum Company. Todman joined the company as a Sales Engineer in the Fireproofing Department at Omaha, Nebr., in 1919. He began his Chicago activity in 1933, when he became District Engineer of Engineering Sales at Chicago. He was named Industrial Sales Engineer at Chicago in 1943.

An engineering graduate of Stanford University, Todman is a member of the Western Society of Engineers, Tau Beta Pi and Theta Xi.

**Henry M. Hedges** has been on home leave, in Evanston, Ill., after his first two years of service as industry advisor in Libya and Sudan under the technical assistance program of the U. S. International Cooperation Administration. One of the various projects he has supervised is a sewage disposal survey of the Khartoum area.

Hedges is a former president of the Insulation Construction Co. of Evanston. In 1951 he accepted an appointment as district administrator of the Trust Territories of Pacific Islands of the Interior.

He served there until 1958, when he joined the ICA.

Mr. and Mrs. Hedges have been staying at the home of Harold E. Anning in Evanston. They will return shortly to Khartoum. Mr. Hedges and Mr. Anning are fellow WSE members.

**Herman Halperin**, general staff engineer in the office of the manager of engineering recently retired from Commonwealth Edison Company after 40 years of engineering service with the utility. He started in 1921 as a junior engineer with the construction department and transferred to the engineering department in 1933. He is a graduate of Cornell University.

Active in committee work for national engineering societies, Mr. Halperin is the author of many technical papers and won an award from the American Institute of Electrical Engineers for the best paper published in 1942. He has been elected to several honorary societies, including Sigma Xi. He has been a member of WSE since 1924.

Mr. and Mrs. Halperin plan to move to California to be near their children and grandchildren, and they will also take a trip around the world.

**William A. Romain** has been elected president of Novo Industrial Corporation, according to Walter E. Bronston, board chairman and chief executive officer of the company. Mr. Romain, formerly executive vice president of Novo, succeeds Mr. Bronston as president.

Mr. Romain, 42, will retain his headquarters at Chicago. He joined Novo—then Industrial Enterprises, Inc.—in December, 1959. Prior to that he was president of Sherman Products, Inc., Detroit. He is a director of The American MonoRail Company, Cleveland, and Sparton Corporation, Jackson, Mich., Fleet Carrier Corporation, Pontiac, Mich., and Novo Industrial.

Vincent M. Story has joined the National Bureau of Standards, U. S. Department of Commerce, Washington, D. C.

Mr. Story will work in the Polymer Structure Section of the Organic and Fibrous Materials Division at the Bureau. He will study structure-reactivity correlations, solvent effects on rates, kinetic isotope effects on rates, reaction mechanisms of organic reactions, synthesis of organic and metal-organic compounds, and synthesis of high-purity polymers.

Mr. Story, a native of Chicago, has completed the requirements for a Ph.D. in physical organic chemistry at the Illinois Institute of Technology. He also studied at the University of Chicago, and received his M.S. in organic chemistry in 1957, his B.S. in physiology in 1952, and his Ph.B. in 1948.

He has done research for the Armour Research Foundation and the Argonne National Laboratory.

Earl Tornquist, director of research for Northern Illinois Gas Company, retired recently after completing 42 years of service with the utility.

Starting his career in 1919, Tornquist served in a number of clerical and supervisory inspection capacities before being named engineer of tests in 1939. He became research engineer in 1950 and director of research last year.

A registered professional engineer in Illinois, Tornquist also is a member of the Chicago Engineering Club, American Institute of Electrical Engineers and the Western Society of Engineers.

Clifford H. Gunther has been named vice-president in charge of methods and application engineering for H. J. Weber & Co., Chicago. Gunther was formerly director of engineering with the United Welders, Inc., Bay City, Michigan. H. J. Weber & Co. are distributors of machine tools and metal fabricating equipment.

**Leo Dolkart**, has been appointed a member of the sub-committee on air pollution by the American Institute of Electrical Engineers. Long a Fellow of the Institute, he has also been serving as a member of the Industrial and Commercial Power Systems Committee. He has been named to act as sub-committee chairman of the Seminar on Management and Conservation of Air Resources scheduled for Oct. 26th and 27th at the University of Nebraska. Mr. Dolkart has also been requested to take the general chairmanship of the Institutional committee of the Illuminating Engineering Society.

**Meissner Engineers, Inc.**, has announced the appointment of Eugene A. Bartkus to the position of vice president, research and development.

**Bartkus**, formerly chief industrial engineer of the firm, will direct an extensive program to further develop new techniques and equipment for MEI and its clients, according to company president **Robert C. Meissner**.

**Bartkus**, 35 years old, has been employed by MEI for 10 years. Bartkus holds bachelor and masters degrees in civil engineering from Illinois Institute of Technology. He previously studied engineering at Darmstadt Technische Hochschule, Germany, and at the University of Kaunas, in his native Lithuania.

**Theodore W. Van Zelst**, was elected a director of the Cenco Instruments Corporation at the firm's annual stockholders' meeting held recently in Chicago.

**Van Zelst** is president and founder of Soiltest, Inc., Chicago, manufacturer of engineering test apparatus for research, educational and laboratory testing of soils, concrete, asphalt and construction materials. Soiltest has been a Cenco subsidiary since 1959.

**Van Zelst** is a graduate of Northwestern University and the University of California, Berkeley, and is an Associate Member of WSE.

**R. D. Maxson**, past president of The Western Society of Engineers, consultant, Sargent & Lundy and senior consultant of Commonwealth Edison Co., recently returned from a two-week's trip to Venezuela. Venezuela has large quantities of natural gas available in connection with its oil production. Much

of it is being wasted by burning in the field. The purpose of the trip was to determine the possibility of using this gas as fuel for thermo-electric generating installations in the economic development of Venezuela.

Four Chicago architectural and engineering firms were appointed recently to design the first 15 buildings to be constructed at a cost of approximately 39 million dollars on the new near west side campus.

For the initial construction stage, the firm of Skidmore, Owings & Merrill was assigned to design 10 buildings to cost 26 million dollars. This firm, which drafted the master plan, also was named coordinating architect for the project.

Structures to be designed by Skidmore, Owings & Merrill will include a 28 story skyscraper for administrative, staff, and faculty offices; a large one story lecture center with a plaza on the roof and an open air amphitheater in the center, a four story library, a four story engineering science labora-

tory building, and two clusters of classroom facilities consisting of six buildings.

Named to design a student union complex with recreational and theater facilities was the firm of Naess & Murphy, 224 S. Michigan av.

A. Epstein & Sons, Inc. was appointed to handle the architectural and engineering work for two service buildings to be constructed at a cost of \$2,100,000.

The engineering firm of Sargent & Lundy was named to design the heating and air conditioning plant and distribution system expected to cost 2 million dollars.

**John E. Linden** has been elected executive vice president of De Leuw & Co., by the Board of Directors, replacing L. H. Cather whose duties have been lightened because of reasons of health.

Mr. Linden joined De Leuw Cather in 1938 and has served in many capacities, including those of secretary, vice president and assistant chief engineer.

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# Reviews of Technical Books



## Structural Analysis

*Frame Analysis* by A. S. Hall and R. W. Woodhead, published by John Wiley and Sons, Inc., 440 Park Ave., New York 16, New York, 1961. Pages 247.

The general theme of the book is the mathematical analysis of structural frames, whether they be two-dimensional three-dimensional, composed of members of various shapes, or having pinned or rigid joints.

The "Flexibility" analysis and the "Stiffness" analysis comprise the two main sections of the book. Of particular interest are the discussion and examples which illustrate that the two methods are the reciprocal approach to the problem.

With the examples presented in this book, the complex framed structures become more than problems of academic interest. The use of matrix algebra is used throughout, with a special appendix covering the use of this tool being included in this text. The use of matrices is of great importance in the analysis of complex frames with the assistance of the electronic computer.

For the engineers who encounter any of the complex structures mentioned above, or for the engineers who wish to obtain a working knowledge of matrix algebra, this text will be an excellent guide and handbook. A.P.A.

## Shock and Vibration

*Shock and Vibration in Linear Systems* by Paul A. Crafton. Published by Harper Brothers, Publishers, 49 E. 33rd St., New York 16, N. Y. Pages, 415. Price, \$10.00.

Since the phenomena of shock and vibration are in essence one, and since they may and usually do occur simultaneously, the general theory presented in this book applies to both.

A knowledge of differential equations is the only mathematical prerequisite. The principles and methods of application of the operational calculus and the

concept of the transfer function used in the study are clearly woven into the text.

By not limiting the study to special classes of systems and their associated provincial problems, the deliberate purpose of the author is to give the reader a clear understanding of the fundamental principles of linear shock and vibration phenomena and of the methods of application of these principles to general structural and mechanical systems.

The book presents a unified analytical and theoretical treatment, making full use of the operational calculus of the Laplace transform, transfer functions, mechanical impedances, and mechanical circuits. It deals fully with transient and steady-state phenomena, with no primary emphasis on the latter.

The text contains problems to demonstrate the principles of shock and vibration. L.M.G.

## American Building Art—The Twentieth Century

*American Building Art—The Twentieth Century*, by Carl W. Condit. Published by Oxford University Press, 417 5th Ave., New York 16, N. Y. Pages 427. Price, \$15.00.

The development of American building art in the twentieth century, influenced by our economic growth and social changes is the basic theme of this book. Professor Condit states that while nineteenth century American building art was greatly influenced by the railroad, much of the twentieth century American building art was, and is being, influenced by the automobile and the airplane.

Basically, this book is divided into two sections, one section dealing with steel structures, the other section dealing with concrete structures.

The structural steel section covers the historical development of modern-day skyscrapers, suspension bridges, aircraft hangars, civic buildings, etc., along with the special architectural features, construction methods, and engineering techniques, which apply to specific struc-

tures. Some of the steel structures reviewed include the Empire State Building, Woodworth Tower, Tribune Tower, Daily News Building, Chicago Union Station, Golden Gate Bridge, and the Mackinac Strait Bridge.

The history of concrete structures consists of the following subjects: (a) column-and-beam, rib framing, slab, shells, and prestressed forms as used in building construction; (b) arch, girder, slab, and rigid frame bridges; and (c) dams. The Majestic Theater Building the TWA Aircraft Hangar at Midway Airport, Westinghouse Memorial Bridge, Hoover Dam and the Grand Coulee Dam are some of the concrete structures reviewed in this text. Metropolitan parkways are treated briefly but concisely in one chapter of this book.

Because of the many illustrations, 134 in all, coupled with clear, concise, semi-technical language, this history book can be easily read and digested by technical and non-technical personnel alike. J.F.G.

## The Fourteen Systems of Units

*The Fourteen Systems of Units* by William R. Varner, Professor of Physics at Oregon State College. Vantage Press, Inc., 120 West 31st Street, New York 1, N. Y. 159 pages. Price \$3.95.

After stating a few definitions, and presenting a brief history of standardization of measurements, the area of physical measurement is quickly entered. Numerous equations are presented and the system of units and their manipulation discussed. Examples are used liberally, and exercise problems made available. Several extensive tables are included to assist in the conversion between one system and another.

A general system of units which resorts to the Greek letters is treated briefly.

The electrical units are handled in a manner similar to the physical units.

Finally several of the complex quantities are treated and their interrelations developed.

D.R.H.



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### POSITIONS AVAILABLE

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cuitry. (B) Research & devel. on transistorized circuits, computer or communication systems for a mfr. of office appliances sal. abt. \$12,000 dep. on exper. loc. Chgo., employer will pay the fee.

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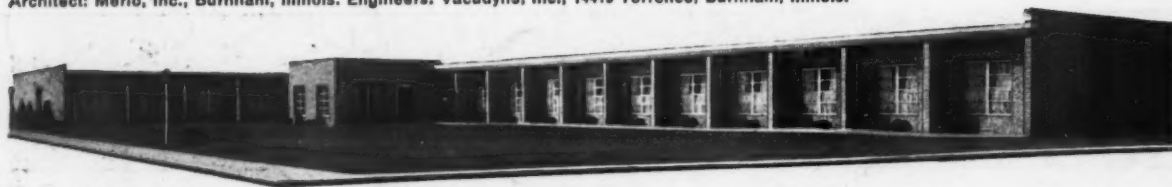
MW: 642 PLANT ENGR. OR DIRECTOR PLANT ENGRG. BSME 49; exper. in bldg. design, construction, maint., design & maint. mech. facilities, power plant design & operation. Construction cost estimating. Sal. \$14,000 U. S.

MW: 649 SALES OR APPLICATION-PLASTICS OR PLASTICS MACH'Y. BSME 24; Engrg. sales, direct & OEM of chem. process eqpt. to chem., steel, paper & other industries. Desire to apply sales engrg. background to field of plastics. Sal. \$7800 loc. Chgo.

MW: 657 STRUCTURAL ENGR. BSCE 30; Reg. P.E. Ill. 3 yrs. exper. in design of industrial bldgs., bridges, foundations & towers. 2½ yrs. exper. in design; analysis & supv. of drafting, mfg., construction & erection of large micro-wave antennas, sal. \$10,000 will relocate.

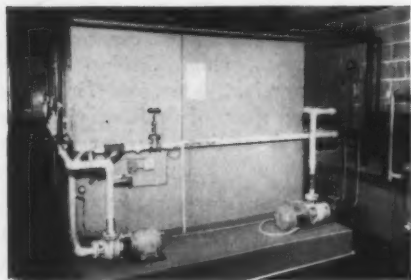
MW: 666 PROJECT ENGR. BSME 29; Reg. P.E. new product devel. controls. 4½ yrs. design of heat exchange eqpt., power plants, boilers, exchangers & evaporators, utility studies, sal. \$9300 loc. Chgo. area.

The Homestead Convalescent Home in Burnham is heated and cooled entirely by gas. Homestead, which contains 19,000 square feet with facilities for 106 beds, plus dining, recreation and therapeutic facilities. Architect: Merlo, Inc., Burnham, Illinois. Engineers: Vacudyne, Inc., 14419 Torrence, Burnham, Illinois.



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More and more, the trend is to year 'round Gas Air Conditioning



The two Arkla heating and cooling exchangers at Homestead Convalescent Home combine to form a cooling capacity of 50 tons and a heating capacity of 896,000 B.T.U./HR.

Whatever the assignment, users find gas, the versatile heat-and-cool fuel, the ideal solution to all-season indoor comfort. Diversity of types of equipment...wide range of equipment capacities...lower costs for installation, maintenance and operation. These just begin to tell the story of advantages...of the sharp turn to gas for complete air conditioning throughout the year.

#### ARCHITECTS—ENGINEERS

Can we help you?

Call Jim Hammers or  
Harold Burgart of our  
Architects' Liaison Staff  
Linden 4-5700



*Service around the clock*

